

SHOE WITH UPPER AND HEEL DEVELOPED VENTILATION**TECHNICAL FIELD.**

- 1 The present invention relates to shoe construction to alleviate perspiration of user's feet and to get a more comfortable walking :mainly it relates to a new improved shoe construction where ventilation for user's foot aereating is obtained both by using the suitable special shaped innersole with an intake in the heel rear portion ,and by using in combination some air
5 channels through the upper sidewalls.

DESCRIPTION OF THE BACKGROUND ART.

- In the past there have been several attempts to develop many shoe constructions to reduce sweat of user's feet and to provide additional confort to the users,but ,by our point of view, the results were not satisfactory,both considering functionality ,their design and manufacturing difficulties .For example some patents set forth an outer sole with many holes
10 inside and a fitted waterproof innersole over said outersole ,with microholes to leave air passage through but avoiding water drops permeation.In this case it is not considered that by walking ,debris,mud,dust and so on , can clog these microholes ,so that ventilation stops after a short period of use.

- Other patents set forth outersoles construction with one or more one-way valves inside
15 which air can pass through , stopping rain water permeation : also in this case these valves can be clogged by debris ,mud ,dust and so on ,because they are in contact or too much close to the dirty surface of the road,so that after a short time of walking,they don't work anymore and the effectiveness of the ventilation diminishes soon.

- Other patents set forth ventilated shoes with air inlet in the heel portion of the shoe but with a
20 reduced air flow ,not improved and increased by the pumped air of the protruding inner lining in the heel portion .These patents furthermore disclose shoe constructions with circulating air inside that can make wearing of the shoe more comfortable ,but failing to provide the shoe with inner air changeable flow depending upon time weather ,cold in wintertime and hot in summer.

- 25 Furthermore some patents set forth shoe construction with some holes in the upper horizontal portion of the toe ,but in this case ,when it is raining,some rain drops can infiltrate into the shoe ,wetting the user's feet .

- Moreover these patents set forth shoe construction with a reduced air inner ventilation not only because they fail to provide the shoe with the rear heel air pump ,as told above ,but also
30 they don't use upper sidewalls channels in combination ,to add vented air to that one drawn into, through rear heel intakes.

It is considered necessary to disclose the shoe manufacturing steps to make easier understanding the industrial manufacturing difficulties of the patents shown above ,where ventilation is provided through the air intake and channels in the heel rear portion.

- 35 Usual shoe manufacturing steps are following:

- a)model design with cardboard elements mainly to cut upper different portions
- b)hollow punches manufacturing including that one for the counterfort to make harder the shoe heel .
- c)upper different pieces cutting.
- 40 d)sewing and gluing of different upper pieces.
- e)turning of the already sewed portions of the upper around the wooden shoe last ,and mainly the heel outer upper,the counterfort and the inner lining ,already glued among them, must be turned under the wooden last ,to be glued or sewed to the outer sole.

- 2 -

f) pressing by the press machine of the upper already sewed and glued portions turned around
 45 the wooden last for outsole gluing. At this step a problem arises, when air channels are
 provided in the heel rear portion, because said air channels must be in connection and in
 perfect alignment with the channels and the air hollows under the inner sole, so that they
 should be inserted among rear outer upper, counterfort and inner lining, but at this
 manufacturing step this introduction is not possible because they are already glued among
 50 them, to get a well manufactured long life shoe.

By our point of view, patents above shown, have not considered these manufacturing
 industrial difficulties without detailing the manufacturing process and without trying to
 simplify the various manufacturing steps.
 Present invention solves above drawbacks.

BRIEF DISCLOSURE OF INVENTION

55 In view of the foregoing disadvantages and working limits of the patented shoe constructions
 above shown in the prior art, the present invention sets forth a developed ventilated shoe
 construction where changeable air flow is provided and expelled both through rear heel
 portion and upper sidewalls channels in combination.

Present invention sets forth a shoe that includes : a) an outer sole, made of different materials
 60 as leather, rubber, plastic or other. - b) an upper made of different materials as leather
 , fabric, plastic etc, sewed or glued to the outer sole - c) an optional reinforced innersole with a
 metal or plastic thin sheet glued to the outsole. - d) a foamed oversole with interconnected
 open chambers, porous cushioned, memory retentent, with mainly one or more hollows under
 the foot sole, that are alternately pressed and expanded, by walking step by step, so that an air
 65 inner ventilation is effected with one or more rear holes as air intakes in the heel portion.

These air hollows are connected among them with one or more channels. - e) on the oversole a
 thin lining, for example of leather, is fitted with many holes for air passage through.

The rear portion of the shoe, the heel, includes : - f) an outer upper. - g) the stiff counterfort, with
 one or more holes for air passage, otherwise without holes but lower than air intake to avoid
 70 its stiffness. This counterfort is glued to the outer upper. - h) the first inner lining glued to
 the counterfort. - i) an inner foamed protrusion called "bellows", with interconnected open
 chambers, with retentive memory, with an empty cavity and the function of little air pump in
 addition to hollows under foot sole, which is connected to, with one or more channels. -

1) second inner lining, or safe-socks, not glued to first lining, to enable the "bellows"
 75 introduction between said two linings. This second inner lining may have a rough surface to
 avoid inside vertical slipping of the foot. Said inner lining safe-socks has a particular
 shape, with an opening in the middle, where the channels, connecting the "bellows" and the
 hollows under the foot-sole, are fitted, and with two side blades, turned under the wooden
 last, before gluing or sewing of the upper to the outsole. In the rear heel portion of the shoe,
 80 one or more openings are fitted, which ventilation air is drawn into during expansion of inner
 sole cavities under foot sole, and which said ventilation air can be expelled through, when
 said cavities are pressed by the user's foot, when he is walking or running.

To avoid the need of many holes on the front horizontal toe, for a better shoe ventilation, as
 effected in above patents, shown in the prior art, which rain water can infiltrate through, and
 85 for an homogeneous increase of the inner ventilation, also some waterproof channels in the
 shoe sidewalls are fitted. To get a satisfactory waterproofing of said channels, connections
 between higher upper portions and lower ones, are made in this special following way : in the

- 3 -

lower upper portions some holes as air intakes are fitted which are surmounted by some protrusions of the higher upper portions, sewed only on two or three sides, leaving one or two
 90 open sides, as air ventilation intakes. In another embodiment, where higher upper portions have no protrusions but only straight outlines, a particular sewing way is used, at interval and with some recesses corresponding to the intakes fitted in the lower upper portions. With these embodiments, no rain drops can infiltrate through these upper channels.

BRIEF DESCRIPTION OF THE DRAWINGS.

The objects of the invention are achieved as set forth in the illustrative embodiments shown in
 95 the drawings to make the invention better understood.

Fig.-1- is a cross sectional view of the shoe, showing the ventilation apparatus of the present invention, with the rear heel air pump or "bellows", the turned outer upper, the counterfort and the first and second inner linings glued to the outsole in the rear position of the shoe.

Fig.-2- is a plan view of the inner second lining and shows its particular shape with the
 100 opening in the middle, as seat of the channels, and two side blades to turn under the wooden last for gluing to outsole.

Fig.-3- is a side view of the shoe, showing the upper sidewall conduits where air can be drawn into and expelled from the shoe, where the higher upper portions surmount the lower portions with some protrusions shielding the lower air passages, avoiding rain water
 105 infiltration.

Fig.-4- is a side view of the shoe, showing another embodiment of the upper sidewall channels where the higher upper portions have no protrusions but straight outlines, sewed with a particular sewing line at interval with some recesses, corresponding to the holes fitted in the lower upper portions.

Fig.-5- is a rear heel view of the shoe, where two straps with plugs are shown, for a total or
 110 partial clogging of two rear air intakes.

Fig.-6- is a cross sectional view of the toe, showing the upper portions surmounting the lower ones corresponding to the air passages.

DETAILED DESCRIPTION OF THE INVENTION.

The following detailed description disclose the invention by way of example and not by way
 115 of limitation. This description will clearly enable one skilled in the art to make and use the invention, with possible changes to shown embodiments without departing from the scope of the invention, so that the following description and the enclosed drawings shall be interpreted as illustrative and not in a limiting sense.

The shoe of present invention shown in the fig. 1 includes :a)an outer sole 2 made of various
 120 materials as rubber, leather, plastic-b)an upper 1, made of various materials as leather, plastic fabric, and so on, sewed or glued to the outsole -c)an optional reinforced innersole 18 with a metal or plastic thin sheet, glued to the outsole-d)a foamed oversole 19 with open interconnected chambers, as air bubbles, porous cushioned, memory retentent, mainly with one or more hollows 6 and 8, under the foot sole, connected by the channels 7, that are
 125 alternately pressed and expanded, walking step by step, so that an air inner ventilation is effected, while air is drawn into and expelled through one or more holes 17 as air intakes in the heel portion. -e)on the oversole a thin lining 4, of leather for example, is fitted with many holes 5 for air passages.

The rear portion of the shoe, the heel, includes:-f)an outer upper 12 with air intakes 17 and
 130 with the turned bottom to be glued to the outsole. -g)the stiff counterfort 13 with one or more holes 17 for air passages, or without holes but lower than air intakes 17 to avoid its stiffness. The counterfort is turned and glued to the outer upper 12 and to the outsole 2.

- 4 -

-h)first inner lining 14 ,turned and glued to the counterfort 13 .-i)an inner foamed protrusion 11 called "bellows" ,joined or separated from the foamed oversole 19 ,under the footsole,with
 135 interconnected open chambers ,memory retentent ,with an empty cavity 9 and working as air pump in addition to the hollows 6 and 8 ,under the footsole which is connected to with one or more channels 20 .-l)second inner lining 10 or safe-socks,not glued to first lining 14 to enable the "bellows" introduction between said two linings.This lining may have a rough surface to avoid vertical inside slipping of the foot.Said second inner safe-socks lining has a particular
 140 shape,shown in fig. 2 ,with an opening 21 in the middle ,where the "bellows" must be introduced during shoe manufacturing ,that is the seat of channels 20 ,and with two sides blades 18 ,to be turned under the wooden last ,afterwards glued to the outer sole 2.

In the shoe rear portion ,there are fitted one or more holes 17 ,which air can enter through , when hollows 6 and 8 under footsole are depressed ,and where ventilation air is expelled
 145 when hollows 6 and 8 are compressed. These intakes 17 can be completely or partially clogged ,by closing one or more holes with horizontal or vertical straps 15 provided with plugs 16 ,so that to change the inner air ventilation flow.

For an increase and an homogenous improvement of the inner air ventilation ,also two upper sidewalls are used as shown hereinafter .To increase ventilation ,avoiding mainly the holes on
 150 the horizontal toe upper, where rain drops can infiltrate, as disclosed above ,on the contrary upper higher side portions 3 and 20 in fig. 3 are sewed or glued in the way that with some protrusions 5 and 5' ,surmount the lower portions 4 and 21 respectively,shielding some holes 8 and 8' in the lower portions,with some particular sewing lines 7 and 7' ,which close the protrusions 5 and 5' on three sides ,leaving open air passages 9 and 9' ,where ventilation air
 155 can be drawn into or expelled.This waterproofing sytem of the air intakes, can be applied also on non-horizontal lines ,but oblique ,where the protrusion ,sewed on three sides , must have the side up sewed and the low side free,not sewed. With this embodiment ,rain water ,vertically falling ,can't infiltrate the sidewall shielded intakes 8 and 8' so that a satisfactory waterproofing of the upper is got.

160 In another embodiment ,shown in fig.4 ,higher upper portion 5 ,with straight outlines without protrusions ,surmountes the lower portions 9 and 4 ,forming wavy some little elevations 15 ,shielding the air intakes 12 and 3 , to avoid rain drops infiltration .The same happens for the higher upper portion 6 that surmountes the lower portion 4 forming little elevations 16 shielding air intakes 3'. These wavy elevations are got by suitable sewing
 165 lines 13 with recesses at intervals.In fig .4 the heel intakes are clogged by vertical straps with hook and loop fasteners 11 .

In Fig. 5 ,that is a rear view of the shoe ,two holes 17 are shown ,as air intakes and outlets that can be clogged by the straps 13 with buttons 14 .To reduce the inner air flow of 50% ,it is possible to clog only one intake .In two sidewalls ,right and left sides ,air conduits 9' shielded
 170 by the protrusions 5' are shown.

The toe cross section of fig. 6 shows the outersole 2 glued to the reinforced innersole 18 and to the foamed oversole 19 with open interconnected chambers :a inner lining 10 with holes 5 is overlying said foamed oversole 19 .On two sides the outer upper 4 and the inner lining 12 are turned and glued or sewed to the outersole 2 ;said outer upper 4 and inner lining 12 are
 175 provided with the holes 8 where ventilation air can pass when it is drawn into and expelled from the conduits 9 .